SPECIFICATIONS FOR PHOTOGRAMMETRIC SERVICES

This document is a reference guide for consultants providing photogrammetric mapping services for Central Federal Lands Highway Division (CFLHD) of the Federal Highway Administration (FHWA), Lakewood, Colorado.

I. GENERAL DESCRIPTION

The work consists of photogrammetric mapping in FHWA U.S. Customary Units format, also known as the U.S. Survey Foot (one meter equals 3937/1200 feet.). The Technical Requirements section of this specification document indicates more specific requirements.

II. TECHNICAL REQUIREMENTS

A. All MicroStation files shall be in Microstation version V8® 2004 edition format. The accepted level structure for Microstation version V8® is shown in map-symbol-V8kjunew005.doc.

B. 3-D FILES

1) All 3-D design files shall be created from the SEED file furnished by FHWA: "seed_3d_US_survey_foot_v8.dgn" using CFLHD dgnlib, cell library, color table and line style resource files. This seed file is being provided to establish proper parameters (e.g., working units, global origin, etc.) to assure FHWA compatibility. The seed file shall NOT BE ALTERED IN ANY WAY.

2) 3-D compilation index file shall be created and named in accordance with the Naming Convention specified in the Scope Of Work. The extension "ndx" shall be used for the type of file. The photo outlines shall be symbolized as LV= 63 and the outline of the actual mapping areas as LV= "E_MAP_Misc_Mapping_Features". Text size and color shall be of your own discretion for labels.

3) Space line strings shall be digitized into 3-D graphics files. These line strings shall depict the topography in the true X, Y, Z position. The space line strings are further broken into the following two types; each with a specific function and specified parameters, the most critical being the correct level.

a) Discontinuity lines (break lines) are space line strings (NOT COMPLEX LINES OR ARCS). These features shall be shown on level: "E_GEO_Break_Line".

i. These space line strings establish the X, Y, Z coordinates of a digitized line string depicting the existing ground. Discontinuity line strings shall be digitized longitudinally along all natural and man made "break lines" or discontinuities. A shot shall be recorded at each break along the discontinuity and at intervals so that the distance between recorded shots does not exceed 25 feet.

ii. Establishing accurate discontinuities is very critical for highway design. These include, but are not limited to: 1) edge of road, 2) roadway ditch, 3) top of roadway cut, 4) toe of roadway fill, 5) drainage lines, 6) ridges, 8) edge of water and 8) retaining walls, etc. The quantity of discontinuities may vary considerably from project to project and even from model to model.

a) Obscurity lines are space line strings shall be placed on level: E_MAP_Obscured_Areas".

i. These space line strings are used to denote the boundaries of obscured areas. Obscured areas can be due to extremely dense vegetation, deep shadows, no stereo and/or buildings. Any data inside an obscurity boundary will be disregarded by FHWA software. Therefore, ground shots and discontinuity lines should not extend into an obscured area. It is anticipated that, except for buildings, the number of obscurities will be minimal. FHWA should be contacted before proceeding if significant areas appear to be obscured.

ii. The space line strings that comprise obscured areas must form a closed polygon. The data points used to form the polygon will be used for contour interpolation and therefore must represent the X, Y and Z coordinate of the ground at each respective point.

C. 2-D FILES

1) All 2-D design files shall be created from the SEED file furnished by FHWA - "seed_2d_US_survey_foot_v8.dgn" using CFLHD dgnlib, cell library, color table and line style resource files. This seed file is being provided to establish the proper parameters (e.g., working units, global origin, etc.) to assure FHWA compatibility. It is required that you DO NOT ALTER seed files.

2) The Naming Convention for 2-D map files is found in the Scope of Work. The extension for this file is ".map".

3) The Naming Convention for 2-D utility files is found in the Scope of Work. The extension for this file is ".utl".

4) FHWA cells for symbols will be furnished to the Contractor in the cell library "smrowV8-k05.cel".

5) All features portraying power, gas, water, sewer or communications features shall be digitized and labeled in the Utility file.

6) All natural planimetric features shall be shown in their true grid coordinate position. Additionally, man-made and natural features pertinent to highway engineering (such as road turnouts, parking areas, wide shoulders, rock slide areas, etc.) shall be digitized and labeled accordingly in the Map file.

7) Grid ticks shall be shown and labeled every 200 feet. Do not label grid ticks where they overprint map data. A grid tick pattern should be shown, so at least 2 grid ticks are placed transverse to the direction of the map sheet at any location. Grid ticks shall be labeled so that values are parallel with the arm of the tick they represent.

8) Control points shall be symbolized with the Tpoint cell. All control points shall be labeled with the appropriate name. Control points are in the control printout provided to the Contractor. Place control points using precision input or by "snapping" to the exact location. Monument elevations shown in the printout, in rare instances, may be different from the ground elevations used for the model setups.

9) The cells furnished by FHWA should generally be placed at an active scale of 1.

10) FONT 2 shall be used to label grid ticks, and control points. Use FONT 24 for all other text. All descriptive text in the (2D) files shall be upper case. The Contractor shall generate line string contours from the 3-D digital terrain models. The contours shall be checked for accuracy.

11) The DTM shall be edited and contours rechecked if bad points are evident.

12) The cell spotx with the appropriate elevation labeled to the nearest 0.1 foot shall designate spot elevations.

D. ACCURACY

1) Planimetrics: Planimetric features shall be placed or digitized within 0.33 of a foot from their true ground position.

III. SPECIFICATIONS FOR DELIVERABLES

The Contractor shall provide all electronic files to CFLHD on DVD+R disks in 1/4" jewel cases with disk labels and jewel case inserts stating the Contractor's Name, date of photography, Mission number and names and sizes of the files contained.